kilometres eastwards over a continual snow desert to a height of 7000 feet. The conditions for a snow-free interior consequently did not exist here; but this expedition, during which men have reached for the first time the interior of Greenland, has given important results as to the nature of the interior of an ice-covered continent. Over the whole inland there is ice. There occur masses of fine dust, partly of cosmical origin, with the ice. The rest of the expedition, under the command of Dr. Nathorst, visited the north-western coast between Waigattel (?) and Cape York. The Esquimaux told our Esquimaux interpreter (Hans Christian, formerly of Capt. Hall's expedition) that two members of the American Polar Expedition had died, and the rest had returned to Littleton Island (Sofia). On August 16 the expedition sailed from Egedesmunde for the south, with rich collections, zoological, botanical, and geological. Short stays were made at Iviktit, Julianshaab, and Frederiksdal. We tried to proceed eastwards thrice through the sounds north of Cape Farewell and once along the coast, but were hindered by ice. We then went outside the ice field to 66° latitude, remaining constantly in sight of land, having twice in vain tried to find an ice-free shore more to the south. The band of drift ice was forced south of Cape Dan. On September 4 we anchored in a fjord which had been newly visited by Esquimaux, and where we found some remains from the Norse period. It was the first time since the fifteenth century that a vessel had succeeded in anchoring on the east coast of Greenland south of the Polar Circle. We tried in vain to anchor in another fjord more to the north, and returned. The expedition arrived at Reikiavik (Iceland) on September 9. Our observations on the temperature of the sea prove that the cold current which packs the ice along the east coast of Greenland is very insignificant; that the glaciers of the east coast are few and of no great size; and that the fjords are free from ice. Probably the coast may be reached by suitable steamers in the autumn of most years."

It will thus be seen that for once Baron Nordenskjöld has failed to fulfil his predictions. But his expedition must be regarded as in all respects successful. He has succeeded in penetrating into the very heart of Greenland, and the idea of taking Lapps with him to skate their way over the rough ice-bound land was a happy one. Greenland thus appears to be what has always been conjectured, a land everywhere covered with a thick ice-sheet. We cannot gather from the telegram whether Nordenskjöld's theory as to the position of the old Norse settlements has been confirmed, but he has, at all events, succeeded in bringing back remains of the old colonies. The analysis of the cosmical dust which has been collected will be eagerly looked for, and the detailed account of the collections made in Northern Greenland.

NOTES

MR. J. Y. BUCHANAN has been invited to accompany the expedition which sailed last week from the Thames to survey the route and lay the cables connecting Cadiz and the Canary Islands, and these islands with Senegal, on the west coast of Africa. During the laying of the cable from Lisbon to Madeira, over a route that had been carefully sounded, into what was believed to be close on 2000 fathoms, it suddenly parted. Soundings taken immediately revealed the existence of a bank with no more than 110 fathoms of water on it, which had been missed while surveying the route. Again, quite recently—indeed, during the last two weeks—the French exploring vessel *Talisman*, which has been investigating this part of the ocean with a numerous scientific staff, under the direction of the veteran Milne-Edwards, discovered another bank to the southward of the "Seine Bank," with as little as 70 fathoms on it. This bank was found to be about thirty miles long from east to west, and six miles broad from north to south. Apart from the special investigation of these banks, the survey of the line o route, which is carried out by two ships working in concert along a zigzag course, sounding every seven miles, must necessarily furnish much important information. Between Madeira and the Canary Islands lies the small group of the Salvage Islands, which may be said to be almost unknown. It is intended to carry the soundings round them, so as to determine whether they are connected with any of the new banks or with known land. It is also intended to land on the islands, from which interesting collections may be expected. In addition to the instruments ordinarily carried in the ships, Mr. Buchanan takes out a new sounding tube, constructed for use with the ordinary wire sounding apparatus. With it it will be possible at every station to secure a good sample of the mud and of the water from the bottom without altering the routine work of the ship. As the route crosses the mouth of the Mediterranean it will thus be possible to determine the extent to which the dense warm water which leaves that sea as a bottom current affects the density and temperature of the deep water of the North Atlantic in its neighbourhood. The ships to be used are the *Dacia* and the *International*, both belonging to the Telegraph Construction and Maritime Company.

IN a communication to the *Sonntags-Beiloge zur Norddeutschen Allgemeinen Zeitung* for September 16 Dr. Reichenow, the well-known ornithologist of the Berlin Museum, describes a new ostrich under the name of *Struthio Molybdophanes.* A living example is in the Zoological Gardens at Berlin, and others are expected at Cologne and Paris. The habitat of this species is stated to be the deserts of Somali Land and the Western Galla country, extending on the east coast of Africa from 10° N. lat. to the Equator.

THE United States steamer *Yantic* has, we regret to learn, failed to reach and rescue Lieut. Greeley and his observing party, who have been stationed at Lady Franklin Bay, in Kennedy Channel, about 81° N., since the summer of 1881. This at first sight looks as if there were little hope of the safety of the party, as they had only two years' provisions with them. But Sir George Nares, who knows the region intimately, writes to the *Times* to show that there is no reason for despair. He gives in detail his reasons for believing that Lieut. Greeley, when the relief ship failed to reach him in 1882, would, like a prudent leader, prepare for the worst and husband his provisions to the utmost. Moreover, he would probably be able to add considerably to his supply by hunting, and on the route southwards there are depots at various accessible points. So, even if another year should have to be spent in the north, there is good reason to hope for the ultimate safety of the party.

ACCORDING to the *Izvestia* of the Russian Geographical Society, the young Tashkend Observatory carries on very useful scientific work. Col. Pomerantseff and his assistants are not only engaged in the verification of those instruments which are used every year for determinations of latitudes and longitudes in Turkestan, and in the computation of the results; they also pursue independent work, such as the observation of the small planets Juno and Pallas; the observation of the last solar eclipse at Penjakent; of the stars eclipsed by the moon, which are given in the *Nautical Almanac;* magnetical and meteorological observations. These last were made in 1882, at twenty stations, out of which eight are first-rank stations, and that of Tashkend makes observations every hour.

THE prize of 500 francs presented by Prof. A. P. de Candolle for the best monograph on a genus or family of plants is announced as open for competition for 1884. Papers in Latin, French, German, English, or Italian should be sent to Prof. Alph. de Candolle, Geneva, before October 1, 1884.

THE *China Mail,* in referring to the Hong Kong Observatory, says that Dr. Doberck will first be instructed to draw up a report for His Excellency the Governor, on the minor stations now in existence. He will examine past records, and, if these are found fairly accurate, will endeavour to furnish certain data as to the climatic conditions prevalent throughout the colony during the different months of the year. When this is done, it will probably be found feasible to make these stations cooperate with the central station at Kowloon, especially in observations connected with typhoons. Another important item will be the determination of the magnetic elements, and the investigation of the magnetic attraction of the various mountains and hills in the colony and its neighbourhood. It is also possible that, under instructions from the Governor, Dr. Doberck will proceed to Manilla, Shanghai, and other places on the coast of China, to inspect the observatories there, and put himself into communication with the directors of those institutions, with the view of having their reports sent regularly to the Hong Kong Observatory to receive careful discussion here with the object of eventually furnishing trustworthy weather forecasts.

MESSRS. ALLEN, COUES, AND BREWSTER, according to *Science,* sign a call for a convention of American ornithologists, to be held in New York City, beginning on September 26, 1883, for the purpose of founding an American Ornithologists' Union, upon a basis similar to that of the "British Ornithologists' Union." The object of the Union will be the promotion of social and scientific intercourse between American ornithologists and their co-operation in whatever may tend to the advancement of ornithology in North America. A special object, which it is expected will at once engage the attention of the Union, will be the revision of the current lists of North American birds, to the end of adopting a uniform system of classification and nomenclature, based on the views of a majority of the Union, and carrying the authority of the Union. It is proposed to hold meetings at least annually, at such times and places as may be hereafter determined, for the reading of papers, and the discussion of such matters as may be brought before the Union. Those who attend the first meeting will be considered *ipso facto* founders. Active and corresponding members may be elected in due course after organisation of the Union, under such rules as may be established for increase of membership. Details of organisation will be considered at the first meeting.

AN enthusiastic meeting of 3000 working men was held in Nottingham recently, at which resolutions were passed maintaining the great importance of sound technical instruction for the manufactures of the country. In connection therewith we may say that it is expected that the technical schools which are attached to the University College, Nottingham, will be opened some time in October next. It is intended in these schools to provide a complete course of instruction in mechanical and electrical engineering, and in the sciences most intimately connected with these professions; also to give instruction to artisan classes in mechanics, and in the details and history of the machinery employed in the lace and hosiery manufactures. The students attending the school will be divided into day and evening classes. It is expected that the day students will consist of young men who intend taking up engineering as a profession, or, being the sons of manufacturers, and looking forward to the management of a manufacturing business, consider it desirable to gain some knowledge of the construction of machinery. For these students the College provides chemical and physical laboratories, and lecture theatres, and class rooms for drawing, mathematics, theoretical mechanics, &c. The workshops now added will comprise tools and mechanism in all departments of work. The shops will be supplied with steam power, and lighted by the electric light. In the evenings classes will be held for artisans. On these occasions opportunities will be given to engineers' apprentices and others to prepare themselves for the annual competition for Whitworth Scholarships. The Mechanical Museum will form a very important feature in the means of instruction provided for lace-makers and hosiers. In this museum will be exhibited models of all the mechanical movements which are generally recognised, with short printed or written descriptions pointing out the special features of each, and their function in lace and hosiery machinery when so employed. Specimens of lace and hosiery machines which can be set in motion, will also be shown, their moving parts being labelled in such a way as to point out their relation to the models above mentioned. The workshops are under the general direction of Prof. Garnett.

DURING the ensuing winter session of the Liverpool Science and Art Classes there will be conducted by Miss Helen Fryer a class for the study of Hygiene. The lectures will follow the course of the syllabus lately published by the Government Science and Art Department. Miss Fryer will also give a course of lectures on Animal Physiology.

THE Directors of the Crystal Palace have completed arrangements for holding an International Exhibition of Arts, Manufactures, Science, and Industry during 1884. It is intended that the Exhibition should open on April 3 and close at the end of October. All the arrangements will be under the control of Mr. G. C. Levey.

BY the kindness of the Trustees of the Gilchrist Fund, the Committee of the Victoria Coffee Hall have been able to arrange for the delivery of six Penny Science Lectures by eminent lecturers on Tuesdays, beginning on October 2. The Committee are anxious that lectures such as these, which are rarely within the reach of the London working men, should be made widely known beyond the circle of the usual frequenters of the Hall, and the Hon. Secretary would be glad to hear from any one willing to help by getting a poster hung up, or distributing handbills among working men in districts within reach of the Victoria. The following are the lecturers and subjects:—October 2 and 9: Lecture by Mr. Wm. Lant Carpenter, F.C.S., on "Ice, Water, and Steam." October 16: Mr. P. H. Carpenter, on "Life under the Ocean Wave." October 23: Mr. E. B. Knobel, Sec.R.A.S., on "Comets." October 30: Mr. C. A. V. Conybeare, on "The Rights and Feelings of an Animal." November 6: Dr. B. W. Richardson, M.D., LL.D., F.R.S., on "Food and Feeding."

WE are glad to see that science has a place in the first number of *The English Illustrated Magazine* (Macmillan and Co.), which contains Prof. Huxley's Royal Institution lecture on the oyster. Mr. Grant Allen contributes an interesting article with some beautiful illustrations on "The Dormouse at Home."

TWO strong shocks of earthquake were felt on Sunday at Casamicciola. A house situated in the upper town was wrecked and fell in ruins. No lives were lost.

CAPT. EDWARD ASHDOWN, Commander of the P. and O. steamer *Siam,* writes as follows to the *Times:*—"It may be interesting to some of your scientific readers to know that the steamship *Siam,* on her voyage from King George's Sound to Colombo, on August 1, when in lat. 6° S., long. 89° E., passed, for upwards of four hours, through large quantities of lava, which extended as far as could be seen (the ship was going 11 knots at the time). The lava was floating in a succession of lanes of from five to ten yards wide, and trending in a direction north-west to south-east. The nearest land was the coast of Sumatra (distant 700 miles), but as there was a current of fifteen to thirty miles a day, setting to the eastward, the lava could not have come from there, and I can only imagine it must have been an upheaval from somewhere near the spot. I may mention the soundings on the chart show over 2000 fathoms. There was a submarine volcano near the spot in 1789."

EXPERIMENTS on the liquefaction of oxygen and nitrogen are described by Wroblewski and Olszewski (*Compt. Rend.* xcvi. 1140 and 1225). At – 136° oxygen liquefies under a pressure of 22½ atmospheres; nitrogen at the same temperature does not liquefy, even under a pressure of 150 atmospheres, but if the pressure is somewhat slowly diminished, care being taken that it does not become less than 50 atmospheres, the nitrogen becomes liquid. Carbon disulphide solidifies at about – 116°, and alcohol at – 130°·5.

FROM the annual report on the mineral statistics of Victoria, we see that the quantity of gold raised in 1882 was 864,609 oz., as against 833,378 oz. in 1881. The deepest shaft in the colony is the Magdala, at Slawell, 2409 feet deep.

THE additions to the Zoological Society's Gardens during the past week include a White-fronted Capuchin (*Cebus albifrons* ♂) from Brazil, presented by Capt. Harrison; a Puma (*Felis concolor*) from South America, presented by Mr. B. M. Whithard; a Grey Ichneumon (*Herpestes griseus*) from India, presented by Mr. Murray Dickinson; a Ruddy Ichneumon (*Herpestes smithi*) from South Africa, presented by Col. J. H. Bowker, F.Z.S.; a Fallow Deer (*Cervus dama* ♀), European, presented by Sir Henry Bessemer; a Persian Gazelle (*Gazella subgutterosa* ♂), two Persian Sheep (*Ovis aries*, var. ♂ ♂) from Persia, presented by Lady Brassey; a Grey Seal (*Halichœrus gryphus*) from Wales, presented by Mr. J. J. Dodgshon; two Rufous Tinamous (*Rhynchotus rufescens*) from Uruguay, presented by Mr. J. Brown; a Spanish Terrapin (*Clemmys leprosa*), South European, presented by Mr. Aitchison; a Yellow-billed Sheathbill (*Chionis alba*) from Antarctic America, two Yarrell's Curassows (*Crax carunculata* ♂ ♀) from South-east Brazil, purchased; a Macaque Monkey (*Macacus cynomolgus* ♂) from India, a Greater Sulphur-crested Cockatoo (*Cacatua galerita*) from Australia, two Small Hill Mynahs (*Gracula religiosa*) from Southern India, deposited.

THE IRON AND STEEL INSTITUTE

THE Iron and Steel Institute has this year resolved to revisit the place of its birth—in other words, the young and flourishing town of Middlesbrough-on-Tees, where the association was founded some fifteen years ago. The arrangements for its reception and for visits to different works in the neighbourhood (though marred in practice by a grievous disaster) left nothing to be desired; but the papers, though sufficient in number and value for practical metallurgists, offer very little that is of interest to the student of science generally. Hence our notice will be brief. It is somewhat to be regretted (especially seeing that the Eston Works formed the first day's excursion) that no paper was devoted to the development of the Thomas-Gilchrist or "basic" process of steel-making. This process has been widely and successfully adopted in Germany, but has made little progress as yet in the Cleveland district, for which it may be said to have been specially designed, and where it was first put in practice. On this disappointment, however, it is useless to dwell. Passing over three adjourned discussions—on tin-plate making, coal-washing machinery, and the manufacture of anthracite pig iron respectively—we come to the new papers prepared for the meeting. There were two dealing with the important manufacture of coke: one by Mr. R. Dixon, on the Simon-Carve's process, and one by Mr. Jameson, on the process which bears his name. We hail these as a further assurance that the barbarous, costly, and offensive beehive oven, which still continues to disgrace our English coking districts, is far on the high road to extinction. In Belgium it has altogether ceased to exist, being superseded by more rational methods; and the same will soon be the case for the rest of the Continent. The two papers before us do not, however, contribute very much to our knowledge. Mr. Dixon's deals simply with the cost of erecting ovens on the particular system described, which cost is unfortunately high, and on the yield and quantity of coke produced, which are both satisfactory. Some difficulty is experienced with the bituminous coal of Durham in keeping the valve-boxes and mains free from pitch; but this, it is hoped, will shortly be overcome. He also describes a method just introduced of heating the air required for combustion by the waste gases passing away from the ovens, by which the time needed for coking is expected to be largely reduced. Mr. Jameson's system, as our readers will remember, consists in burning the coal from the top in a closed oven, and withdrawing the gases, as they form, from the bottom, by means of an exhausting apparatus. These waste gases are condensed, and give valuable results in ammonia, tar, &c. The amount of this yield has been largely increased, since former papers were read on the subject, by new extracting and condensing appliances, and the percentage of coke made appears also to have improved. One great advantage of the system is that any beehive oven can be adapted to it at a cost of some 10*l.* or 15*l.* The oils extracted, the value of which had been questioned, find a ready sale at 2*l.* to 3*l.* per ton.

A paper on raw coal in the blast furnace, prepared by Mr. I. Lowthian Bell, F.R.S., was postponed, in consequence of its author's serious illness—an illness from which we are glad to hear that he is recovering. We pass on to a paper by Mr. E. A. Cowper, Past President of the Institute of Mechanical Engineers, on the results obtained with the hot-blast stove which bears his name. This, as is well known, is an application to the blast furnace of the fire-brick "regenerator" invented by Sir Wm. Siemens for gas furnaces. In the earlier days of the hot-blast process, the best known means of heating the air was to pass it through a sort of coil of cast-iron pipes, inclosed within a tall furnace. The limit of endurance with such pipes is, however, reached at about 1000° F.; whereas by employing two inclosed stacks of fire-bricks, one of which is always being heated from below, while the other is being cooled from above by air passing through it to the furnace, temperatures of 1500° are attainable. The advantages of so far increasing the temperature were hotly contested, from a theoretical point of view; but "the proof of the pudding is in the eating," and Mr. Cowper has proved beyond doubt that a blast of 1500°, combined with a very large and slowly-working furnace, will realise an economy (in fuel consumed per ton of iron made) which, in these days of competition, means just the difference between a fair profit and a heavy loss. The chief element of success in these stoves appears to be the making of the bricks as thin as possible, so that there may be but little depth for the heat to soak into or soak out of; and the author describes a form of brick, making what he calls "honeycomb filling," with which there is nowhere a greater thickness than two inches, and this is always heated from both sides.

Two papers on hydraulic cranes for steel works, by Mr. R. M. Daelen and Mr. T. Wrightson, and another by Mr. J. E. Stead, on a new form of gas sampler, do not require any special comment. Finally we have a paper on blast furnace economy in relation to design, by Mr. R. Howson, which is of a somewhat more suggestive character. The almost universal form of the interior of a blast furnace is as follows:—From the throat, where the materials are charged and the gases collected, it widens slowly to a point about two-thirds of the way down, called the boshes. From thence it narrows again, but more rapidly, and ends in a shallow circular pit called the hearth. Mr. Howson asks whether this form has not, from beginning to end, been a "rule-of-thumb business" with English engineers; and whether the rapid narrowing below the boshes does not in fact favour the lodgment of half-melted cinder, and the consequent building up of "scaffolds," which are known to be the most serious of all impediments to the successful working of a blast furnace. It is supposed that the hearth needs "relief from pressure;" but as a matter of fact the difficulty is to get the materials down quickly enough, and the easier their descent is made the better. He proposes a barrel-shaped form, having a regular curve at the boshes, instead of a sharp angle—a form actually adopted by the late Mr. Menelaus at Treforest, and with great success as to economy of fuel. With the same object he advocates the charging of the coke towards the sides of the furnace, and the stone towards the middle, and the preserving of this distribution throughout, so as to have as much combustible material as possible above and near to the tuyeres.